

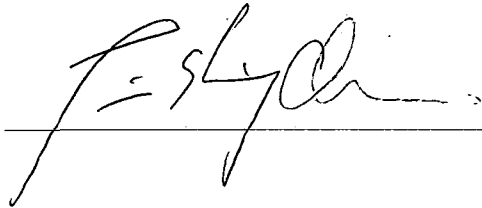
**HSERC MEMBERS OR THE VOTING REPRESENTATIVES'  
SIGN-IN SHEET FOR December 19, 2014**

Scott Enright  
Dept. of Agriculture  
Board of Agriculture

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Tin Shing Chao  
Occupational Safety and Health Division  
Department of Labor and Industrial Relation

---



Henry Silva  
Hawaii Representative/LEPC Chairperson  
Hawaii County Fire Department

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Alexander J. Adams  
Honolulu Representative/LEPC Chairperson  
Honolulu Fire Department

---

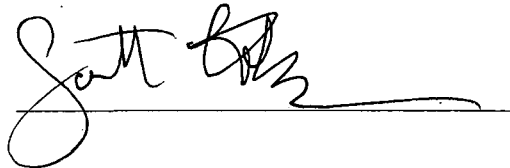


Albert Kauai  
Kauai Representative/LEPC Chairperson  
Kauai Fire Department

---

Scott Kekuewa  
Maui Representative/LEPC Chairperson  
Maui Fire Department

---




Gary L. Gill  
Deputy Director, Environmental Health  
Department of Health

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for Jessica Wooley  
Director  
Office of Environmental Quality Control

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# HSERC MEMBERS OR THE VOTING REPRESENTATIVES' SIGN-IN SHEET FOR December 19, 2014

Audrey Hidano,  
Deputy Director - Administration  
Department of Transportation

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William M. Tam  
Deputy for Commission on Water  
Resource Management  
Department of Land and Natural Resources

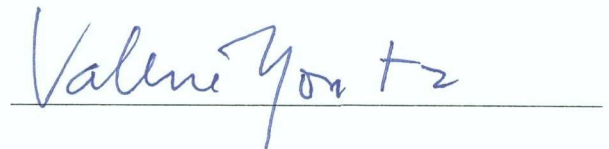
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Doug Mayne  
State Civil Defense  
Department of Defense

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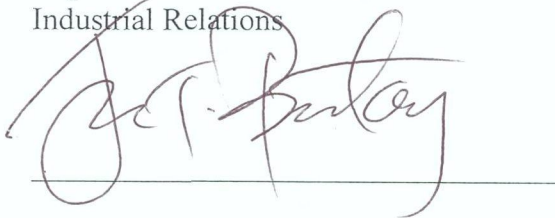


*FBV*  
Kathryn Braun  
Director  
Office of Public Health Studies  
University of Hawaii at Manoa



Jade Butay,  
Deputy Director  
Department of Labor and  
Industrial Relations

---



Mark Want,  
Energy Analyst  
Department of Business Economic  
Development & Tourism

---



HSERC MEETING SIGN-IN SHEET FOR December 19, 2014

Name	Organization	Telephone #	Fax #	E-Mail
Gerald Kosaki	HI County LEPC	808-443-4150	808-932-2928	gerald.kosaki@hawaii-county.gov
ROBERT H. HARTER	CIC OF DEM	808-823-8958		RHARTER@HONOLULU.GOV
Curtis Markon	<del>HEER</del>	586-4249		
Lara McIntyre	DOH - EPO			
Liz Galvez	HEER	586-4249		
Adam Tedell	HEER	586-4249		
HERMAN TUOLOSEGA	OEQC	6-4185		
David Johnston	DOH DOLD	586-8306		
TONY LAM	HIOSH	586 9090		
Nancy Barthel	ERO	6-7567		

HSERC MEETING SIGN-IN SHEET FOR December 19, 2014

Name \_\_\_\_\_ Organization \_\_\_\_\_ Telephone # \_\_\_\_\_ Fax # \_\_\_\_\_ E-Mail \_\_\_\_\_

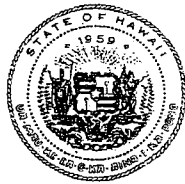
BILL MARHOFFER USCG A14/ORRT 808 535 3416 WILLIAM.R.MARHOFFER@USCG.MIL

MARTY SMITH " " 808-535-3325 MARTIN.L.SMITH@USCG.MIL

Chris Curatilo Tetrattech 808 589-6009 chris.curatilo@tetrattech.com

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STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P. O. BOX 3378  
HONOLULU, HI 96801-3378

In reply, please refer to:  
File:

LIEUTENANT GOVERNOR'S  
OFFICE

14 DEC 12 P12:56

HAWAII STATE EMERGENCY RESPONSE COMMISSION  
MEETING #97

Friday, December 19, 2014 from 9:00 a.m. to 12:00 p.m.

Department of Health  
919 Ala Moana Boulevard, Fifth Floor  
Honolulu, Hawaii 96814

AGENDA

- 1) 9:00 Call to Order  
Announcements, Remarks, Introduction  
Approval of Minutes from Mtg #96  
Gary Gill, Deputy Director for  
Environmental Health
- 2) 9:20 LEPC Updates  
Henry Silva, Hawaii LEPC Representative  
Albert Kauai, Kauai LEPC Representative  
Scott Kekuewa, Maui LEPC Representative  
Alex Adams, Oahu LEPC Representative
- 3) 9:40 School Chemical Lab Clean Up  
Up Date  
Travis Hiramoto, Solid -Hazardous Waste  
Branch
- 4) 10:00 Information on Ebola Training  
David Johnston, MPH, Epidemiologist  
Disease Outbreak Control Division
- 5) 10:40 Information on Lava Flow  
Doug Mayne, State Civil Defense
- 6) 11:00 HMEP Grant  
Harold Lao, HEER Office
- 7) 11:15 HSERC Financial Report  
Tier II Division of Funds,  
Decisions  
Curtis Martin, HEER Office
- 8) 11:30 Other Business  
HSERC, LEPC
- 9) Schedule next HSERC Meeting  
HSERC, LEPC

LINDA LINGLE  
GOVERNOR OF HAWAII



CHIYOME LEINAALA FUKINO, M.D.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. Box 3378  
HONOLULU, HAWAII 96801-3378

In reply, please refer to:  
File: EHA/HEER Office

2015 - 258 sl

June 10, 2015

LEPC Chairs:

At the HSERC meeting held on December 19, 2014, the TIER II funds in the amount of \$69,921 that is presently available to the LEPCs has been approved by the HSERC membership to be dispersed in the following manner: by percentage of **TIER II** funds collected in each emergency planning district for the 2012 calendar year. The following is the distribution to the nearest dollar:

<b>Honolulu</b>	<b>\$69,921 x 44.69% = \$ 31,247.69</b>
<b>Hawaii</b>	<b>\$69,921 x 23.94% = \$ 16,739.09</b>
<b>Maui</b>	<b>\$69,921 x 19.34% = \$ 13,522.72</b>
<b>Kauai</b>	<b>\$69,921 x 12.03% = \$ 8,411.50</b>

If there is any additional distribution of funds, it shall be approved by the HSERC committee members.

Please invoice the HEER Office for your respective LEPC funds.

One of the conditions in receiving funding requires the LEPC to conduct quarterly meetings. Please send a tentative schedule for your FY14-15 quarterly LEPC meetings to Sharon Leonida via postal mail or e-mail.

If there are any questions, please call (808) 586-4249.

Sincerely,

C. Curtis Martin  
Emergency Preparedness and Response/Prevention Section

FY 15 LEPC BUDGET SPLIT

FINAL October 28, 2014

Straight Percentage Split:

Honolulu	$\$ 69,921 \times 44.69 \% = \$ 31,247.69$
Hawaii	$\$ 69,921 \times 23.94 \% = \$ 16,739.09$
Maui	$\$ 69,921 \times 19.34 \% = \$ 13,522.72$
Kauai	$\$ 69,921 \times 12.03 \% = \$ 8,411.50$

October 27, 2014  
HAWAII STATE EMERGENCY RESPONSE COMMISSION

FINAL FY 15 BUDGET

Collections from the TIER II Reports: \$83,300

HSERC Expenses:

To attend LEPC Meetings: \$6,552.00

NASTTPO Mid-Year Conference 2014,  
Houston, Texas \$3,012.00

NASTTPO Conference 2015, Portland, Maine \$3,815.00

Funds available for distribution to the LEPCs:

\$ 83,300  
-6,552  
-3,012  
-3,815

\$69,921

TIER II Reporting Facilities by Counties (based on Tier2Submit 2012):

City & County of Honolulu	379	44.69%
County of Hawaii	203	23.94%
County of Maui	164	19.34%
County of Kauai	102	12.03%

# HEPCRA REPORTING YEAR 2012

## Number of Paying Facilities In Each County

	<u>Facilities</u>	<u>Military</u>	<u>Total</u>
Kauai	106	4	102
Maui	167	3	164
Hawaii	207	4	203
Oahu	412	27	<u>385</u>
			854

## Planning Grant

The planning grant funds will be used for the following activities.

1. Annual HazMat Exercises for each of the LEPCs.
2. Update of Emergency Operation Plans
3. LEPC Support
4. Mid-Year National Association of SARA III Program Officials (NASTTPO) Convention in Houston, Texas, October 2014.
5. National Association of SARA III Program Officials (NASTTPO) Convention in Portland, Maine, May 18 – 21, 2015.

Since Hawaii is an island state, meeting to share and discuss information involves substantial traveling.

HSERC meetings are held quarterly. Each LEPC should follow a similar schedule. A representative from each of the LEPCs attends each HSERC meeting. The HEPCRA Coordinator, and a State On Scene Coordinator with primary responsibility for the county, attends each LEPC meeting. Each county encompasses different islands. The only way to reach another island, in a timely manner, is by air. In the Fiscal Year 14-15, a one-way coupon cost \$110.00; a car rental coupon cost \$51.00; meal allowance of \$20.00 and parking of \$15.00.

## LEPC Meetings

Airfare: We are planning for four meetings annually. There are four counties. Two HEER representatives fly to twelve of the sixteen meetings.  $2 \times 12 \times \$220 = \$5,280.00$   
 Rental Car: 12 meetings  $\times$  \$51 = \$612.00  
 Meal Allowance:  $2 \times 12 \times \$20 = \$480.00$   
 Parking:  $12 \times \$15 = \$180.00$   
 Total: \$6,552.00

## NASTTPO 2014 Mid-Year Meeting in Houston, Texas, October, 2014

Airfare: \$800.00  
 Registration: \$250.00  
 Mid-Year Meeting Fee for NASTTPO: \$50  
 Luggage Charge = \$50.00 (R/T)  
 Per diem:  $6 \times \$145.00 = \$870.00$   
 Fare from airport to hotel:  $2 \times \$25.00 = \$50.00$   
 Estimated lodging is \$121.00 per day:  $6 \times \$121.00 = \$726.00$   
 Excess expense for lodging:  $6 \times \$36.00 = \$216.00$   
 Total: \$3,012.00

## National Association of SARA III Program Officials (NASTTPO) Convention in Maine, May 2015.

Airfare: \$1200.00  
 Registration: \$385.00  
 Meeting Fee for NASTTPO: \$35.00  
 Per diem:  $6 \times \$145.00 = \$870.00$   
 Luggage charge = \$50.00 (R/T)  
 Fare from airport to hotel:  $2 \times \$25.00 = \$50.00$   
 Estimated lodging is \$160.00 per day:  $5 \times \$160.00 = \$800$   
 Excess expense for lodging:  $5 \times \$85.00 = \$425.00$   
 Total: \$3,815.00

The total cost for the HSERC and LEPC activities for the year is \$13,379.00.



# Maui L.E.P.C.

Attn: Scott Kekuewa, Chair - Maui LEPC  
200 Dairy Road  
Kahului, HI 96732-3123  
Phone: (808)270-7911

RECEIVED  
DEPARTMENT OF HEALTH

2015 JUN 15 A 2:01

HEER OFFICE

DATE: January 8, 2015  
INVOICE #: 2015-001  
FOR: FY15 Maui LEPC  
operating funds

**Bill To:**

Attn: Sharon Leonida  
State of Hawaii, HEER Office  
919 Ala Moana Blvd., Suite #206  
Honolulu, HI 96814  
Phone: (808)586-4249

DESCRIPTION	AMOUNT
Transfer of funds as approved by the Hawaii State Emergency Response Commission for operational expenses on December 19, 2014  note: Transfer funds to the Maui County Local Emergency Planning Committee account #106049  <b>ORIGINAL</b>	\$13,522.72
<b>TOTAL</b>	<b>\$ 13,522.72</b>

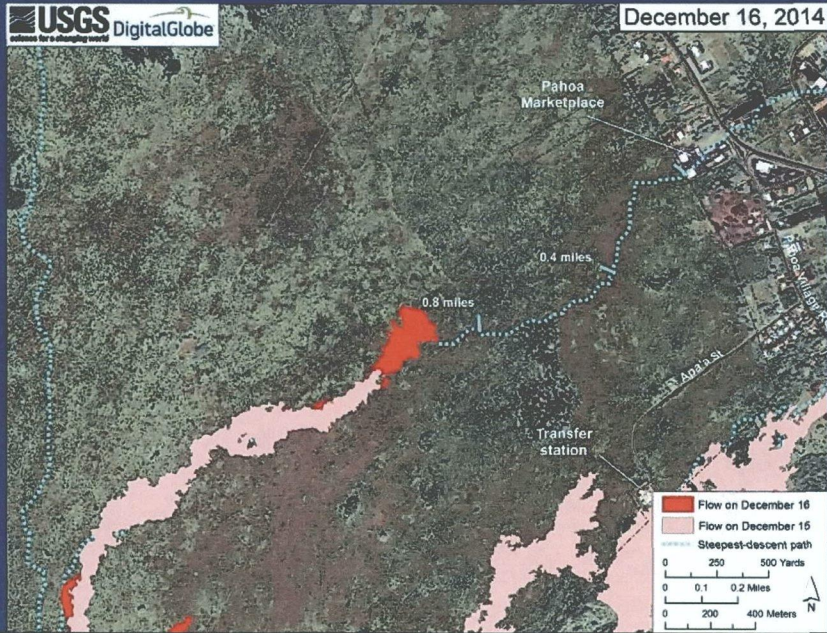
Make all checks payable to: Maui LEPC  
If you have any questions concerning this invoice, please contact:  
Scott Kekuewa, Chair - Maui LEPC  
Phone: (808) 270-7911 work (808)357-0332 cell  
Fax: (808)270-7919

**MAHALO NUI LOA**

# Eruption Update

USGS DigitalGlobe

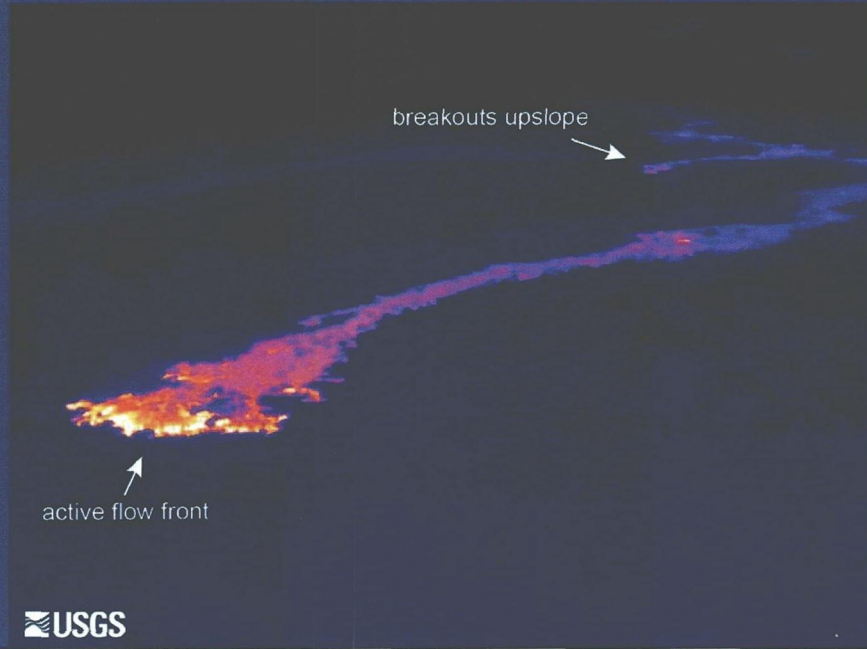
December 16, 2014



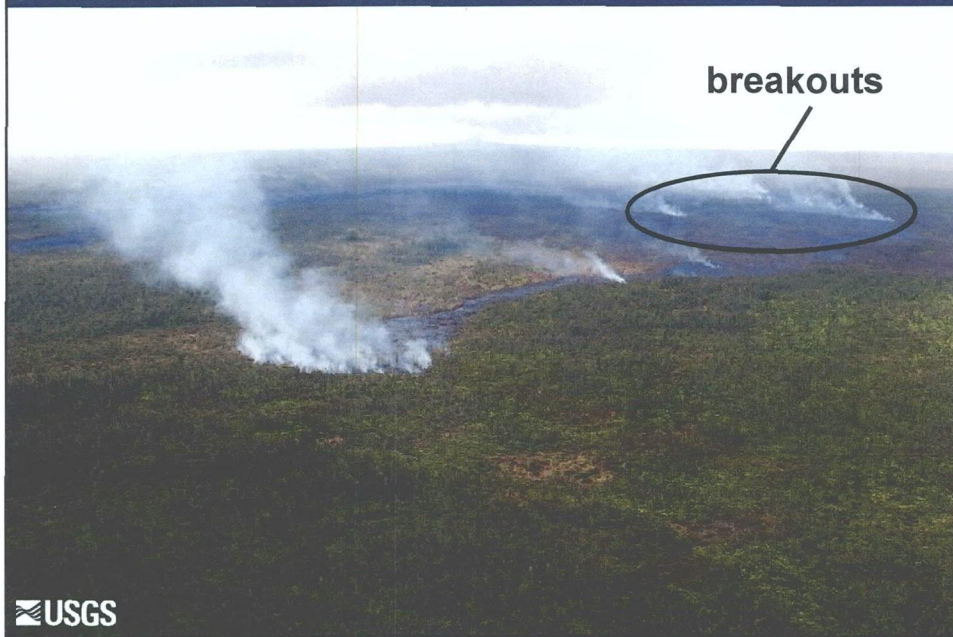
## December 16, 2014



December 16, 2014

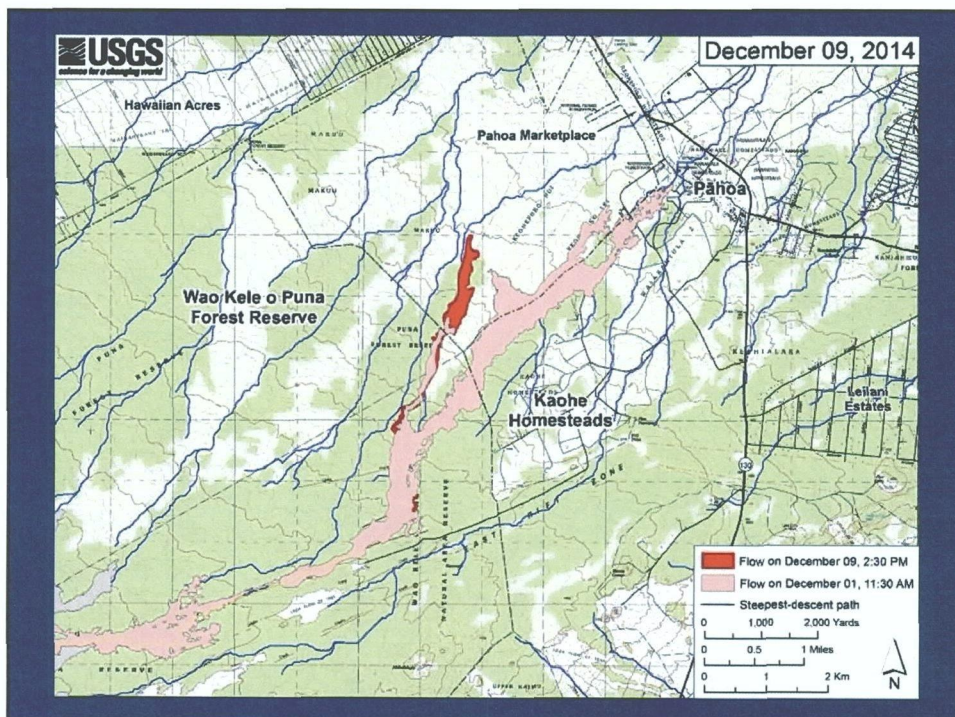


December 16, 2014

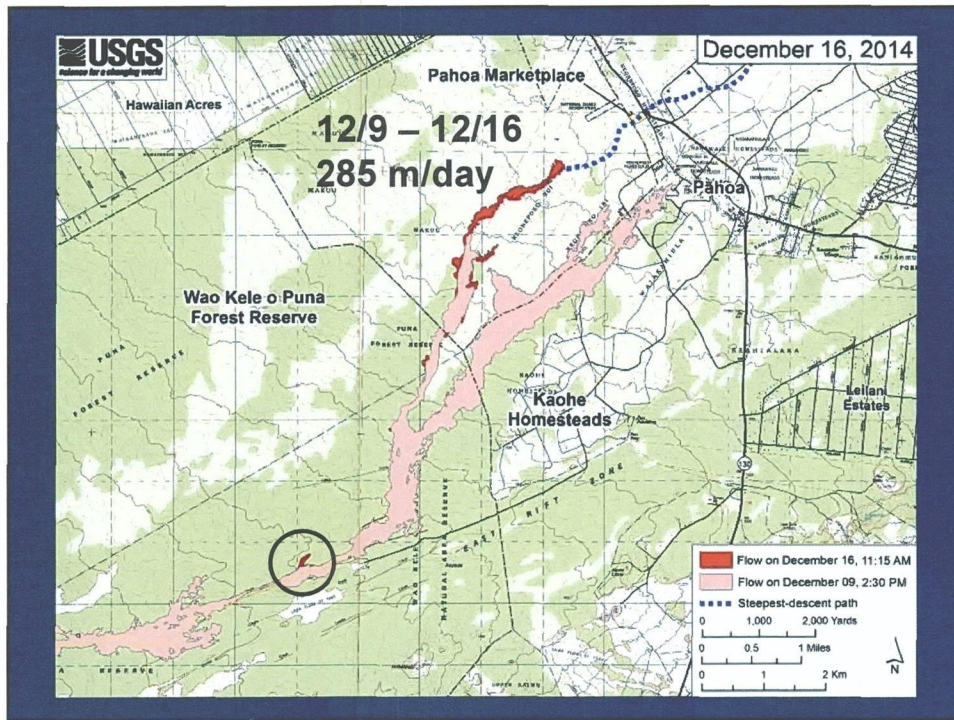




December 16, 2014



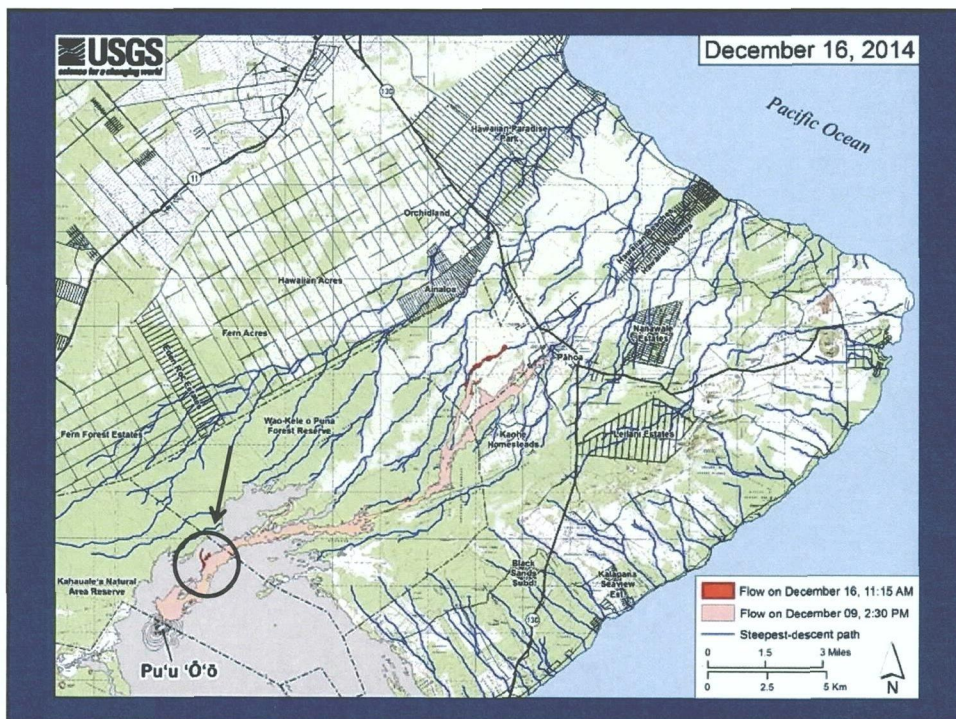
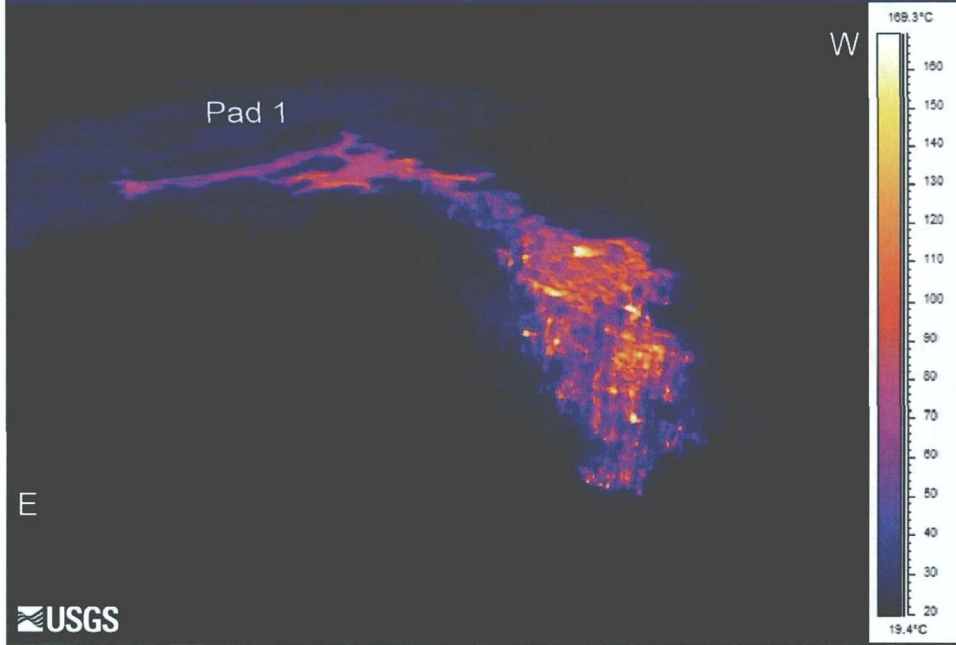




December 16, 2014



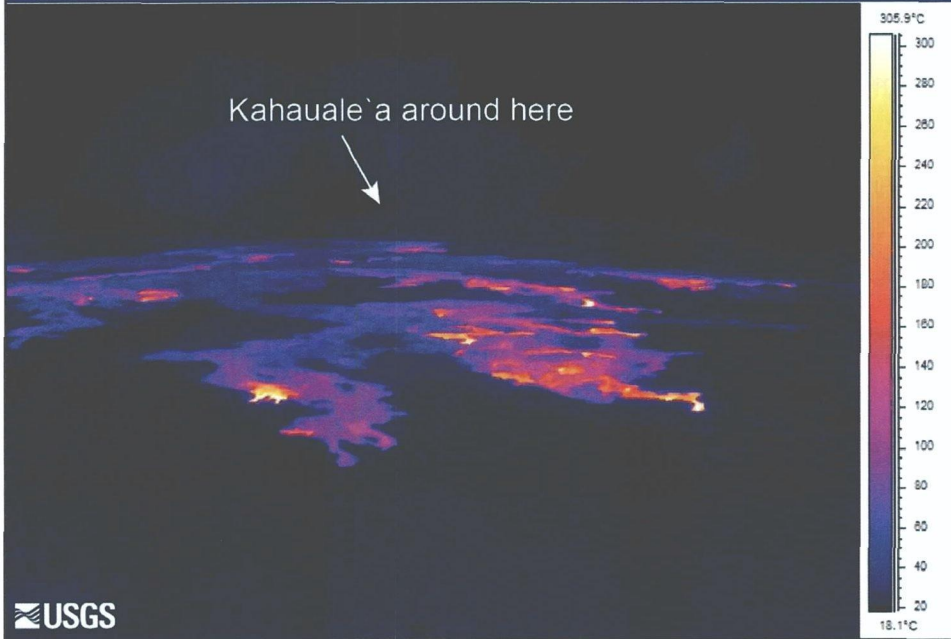
December 16, 2014





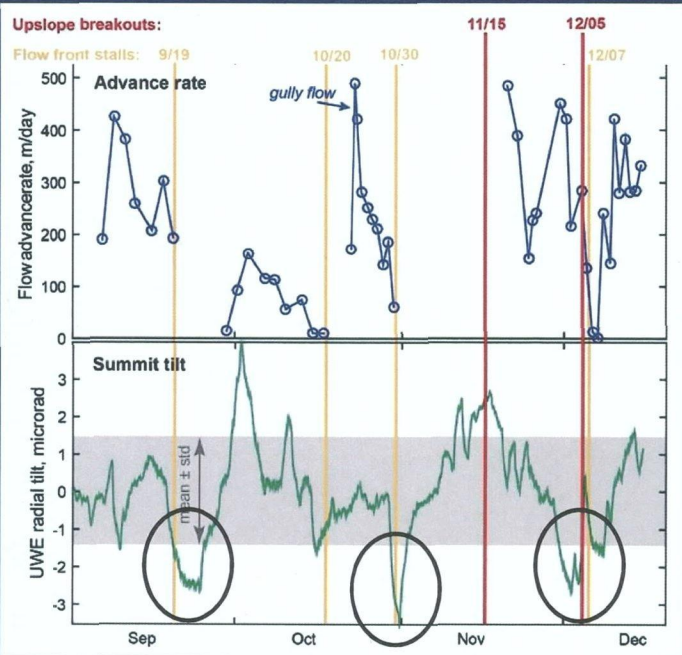
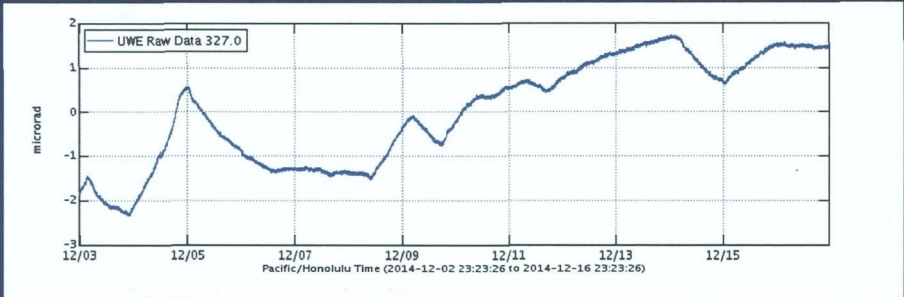
December 16, 2014

Kahauale`a around here



**Lava discharge:  
about 60% of peak in August 2014  
(1.5 cubic m/sec = 420 gallons/sec)**

# Summit Tilt: Inflationary Trend



December 16, 2014

- New lobe continues to advance:
  - 11/24 -12/1: 400m/day
  - 12/1 – 12/9: 175 m/day
  - 12/7 – 12/9: 150 m/day
  - 12/9 – 12/16: 285 m/day
- Flow is following steepest descent path toward Pahoia Marketplace & flow front has widened: 200 m on 12/16
- No “hint” that lava advance will slow from summit tilt trend, Pu‘u ‘Ō‘ō discharge, breakouts from tube, unless?

 USGS

# June 27<sup>th</sup> Lava Flow Community Needs Survey (11/20/2014-12/11/2014)

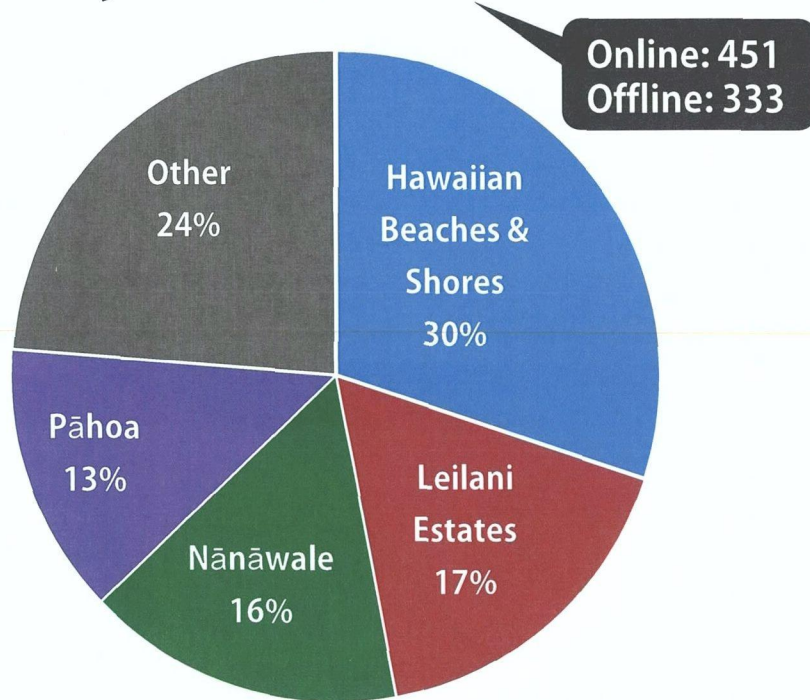
Hawai'i Island United Way  
and  
Hawai'i County Civil Defense  
in collaboration with  
Mark Kimura, Ph.D. and Kathryn Besio, Ph.D.  
Geography and Environmental Sciences, UH Hilo



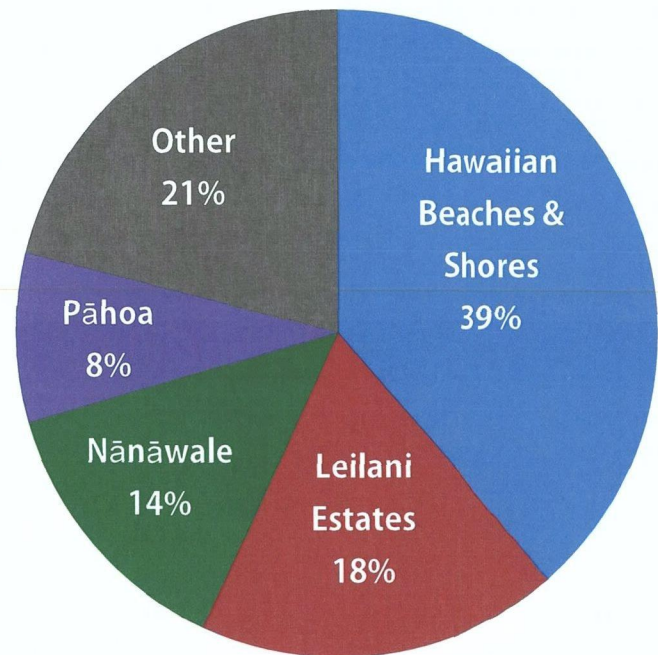


# Surveyed Sample

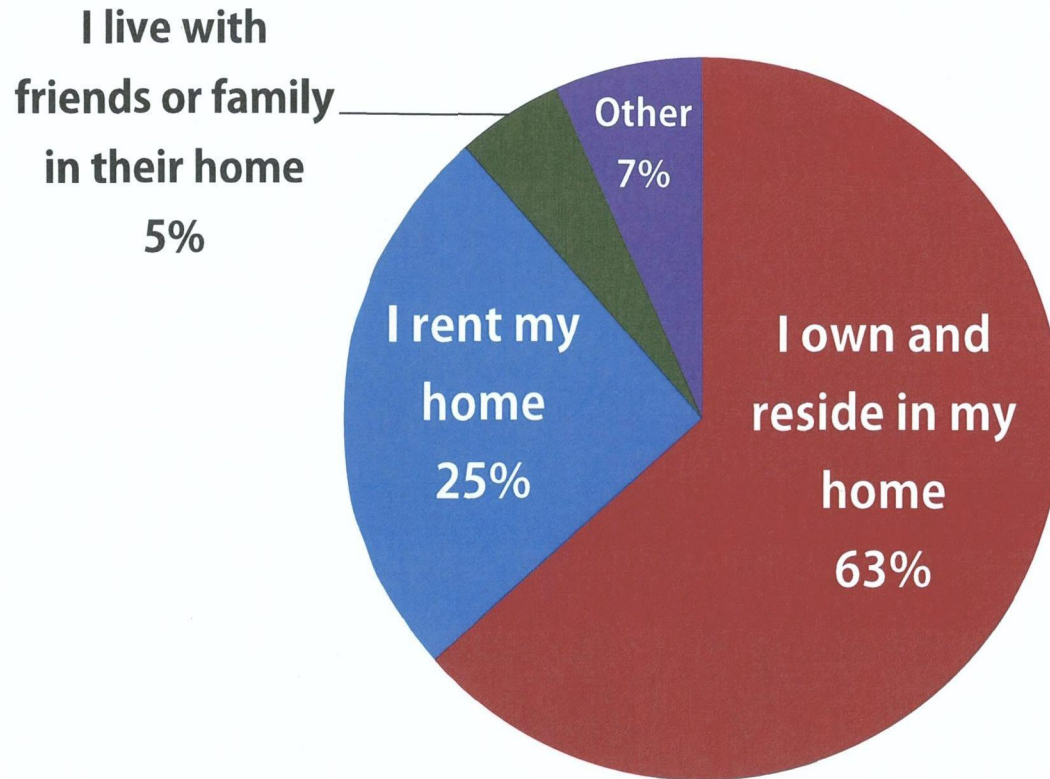
Survey (784 responses)



Census 2010 (3,809 Households)

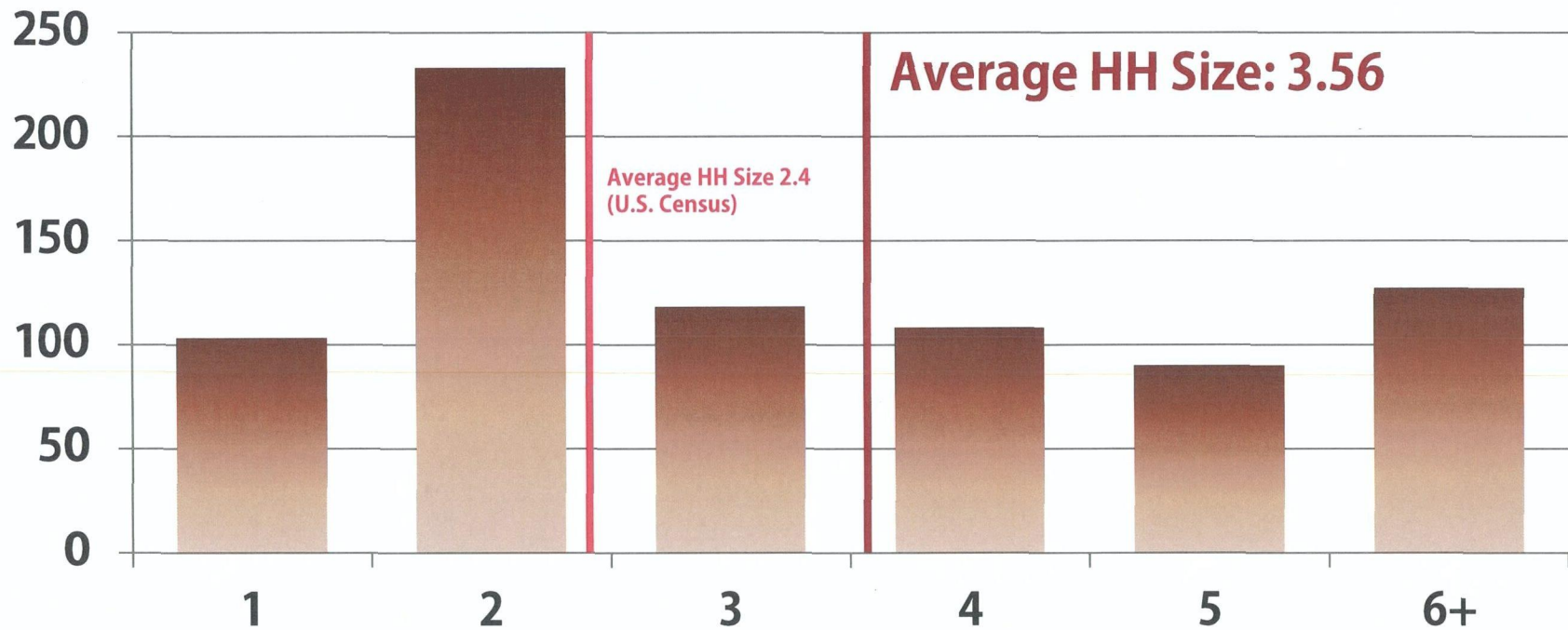


# Living Situation

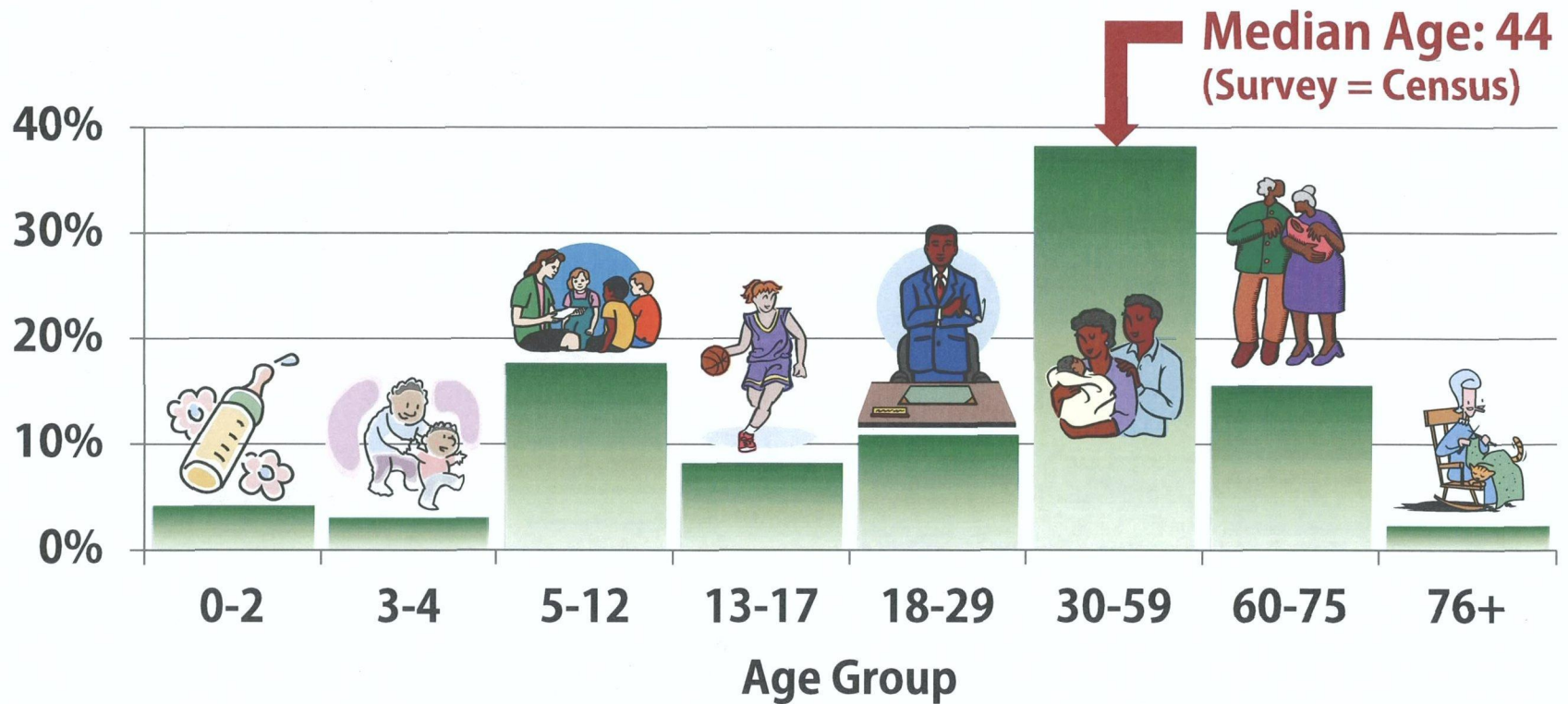




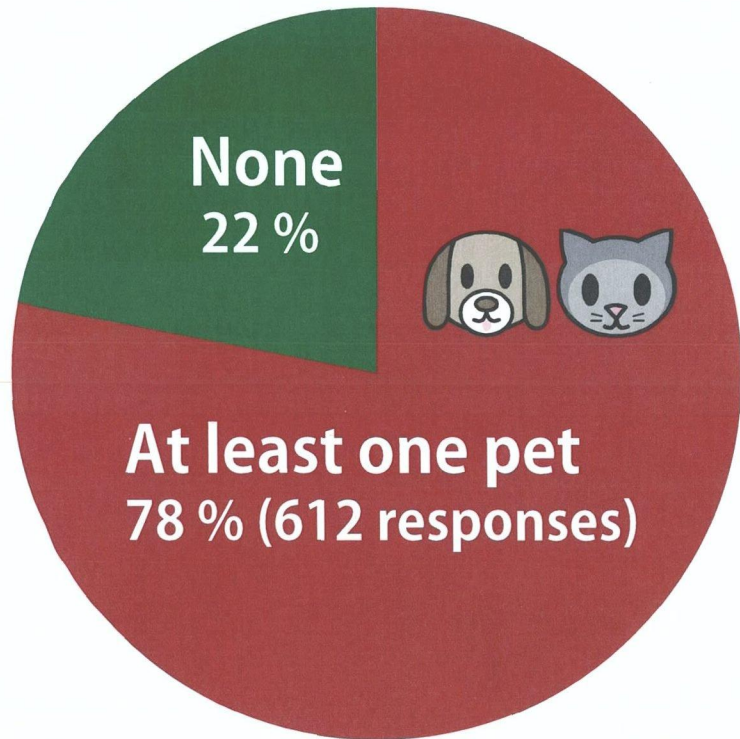
# Household Size Distribution



# Age Distribution



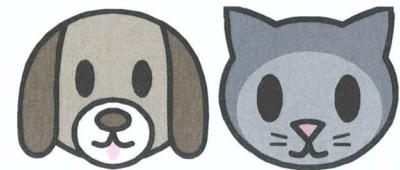
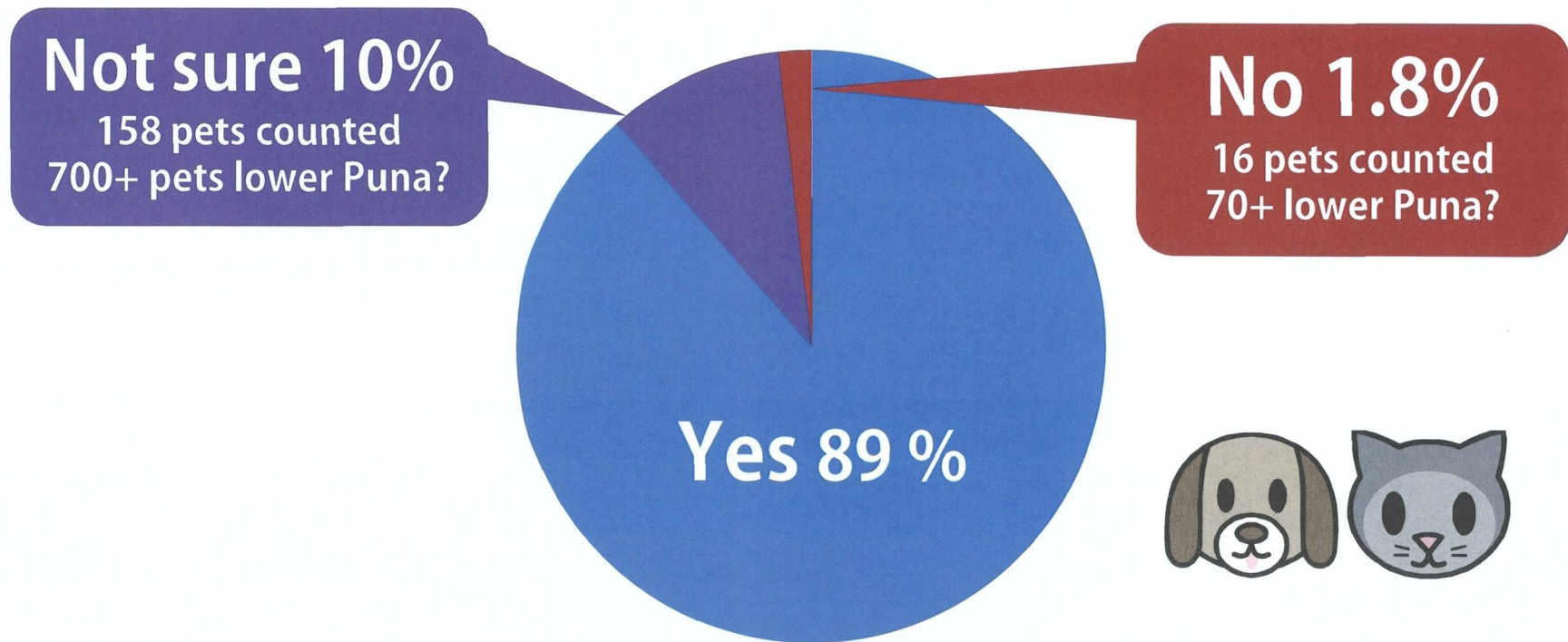
# Pets (Dogs, Cats, etc.)



Total number of pets from the survey: **1,671+**

Potentially  
**8,000+**  
in the affected area  
of lower Puna

# Will they take their pets?

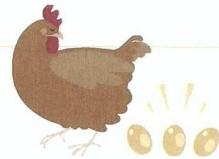




# Livestock

## Small animals

- At least one animal: **13%**  
(101 from survey)
- Possibly 490+ in the entire area



## Large animals:

- At least one animal: **4%**  
(28 from survey)
- Possibly 100+ in the entire area

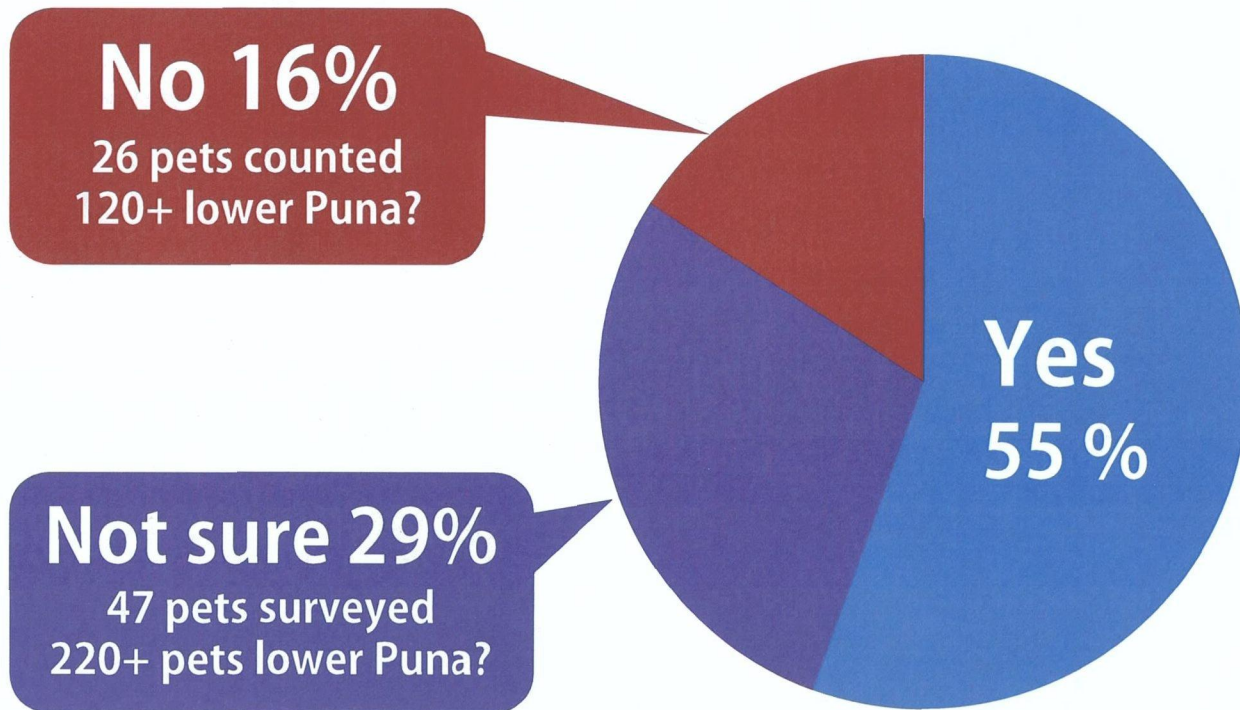


## Fish and Aquaculture:

- At last one: **8%** (65 from survey)
- Possibly 300+ in the entire area

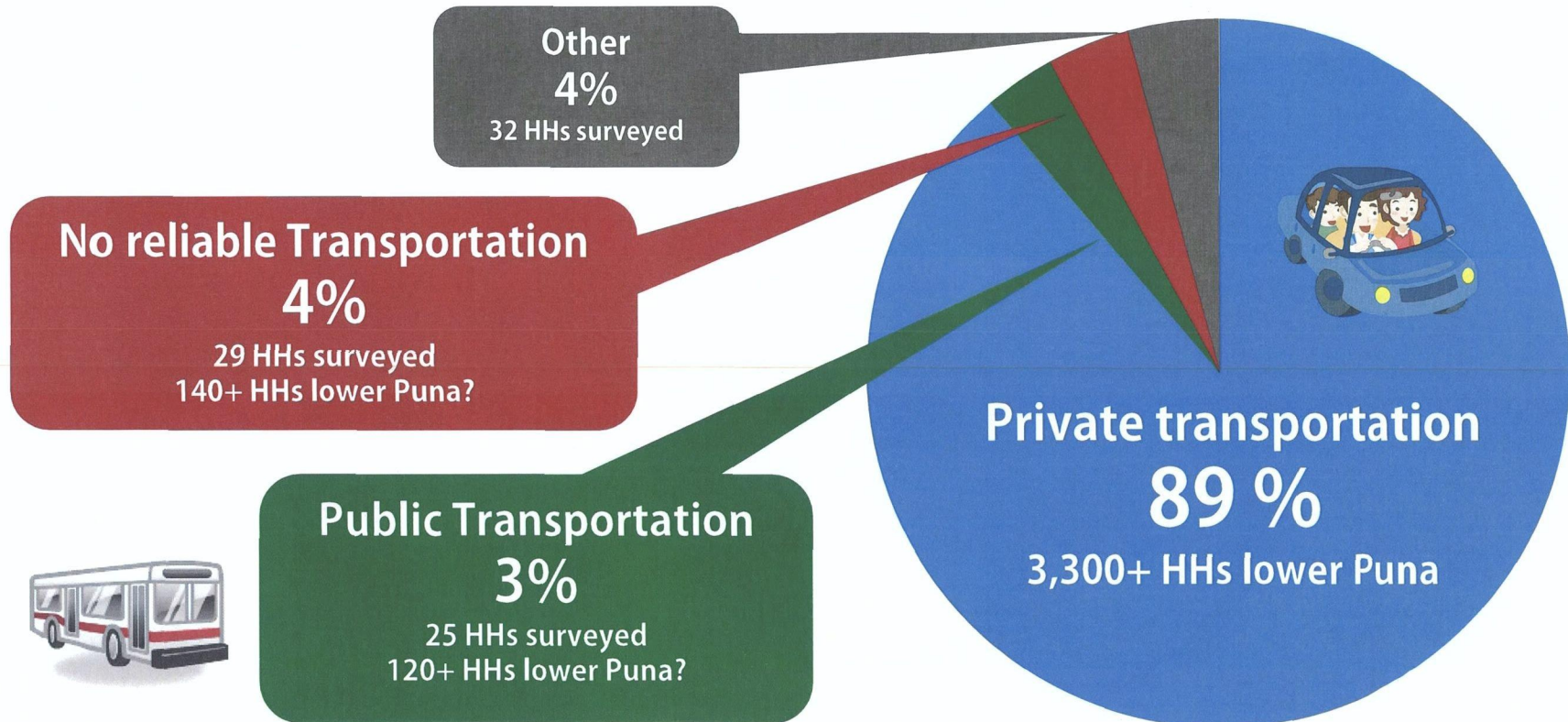


# Will they take their livestock animals?





# Transportation



Other  
4%  
32 HHs surveyed

No reliable Transportation  
4%

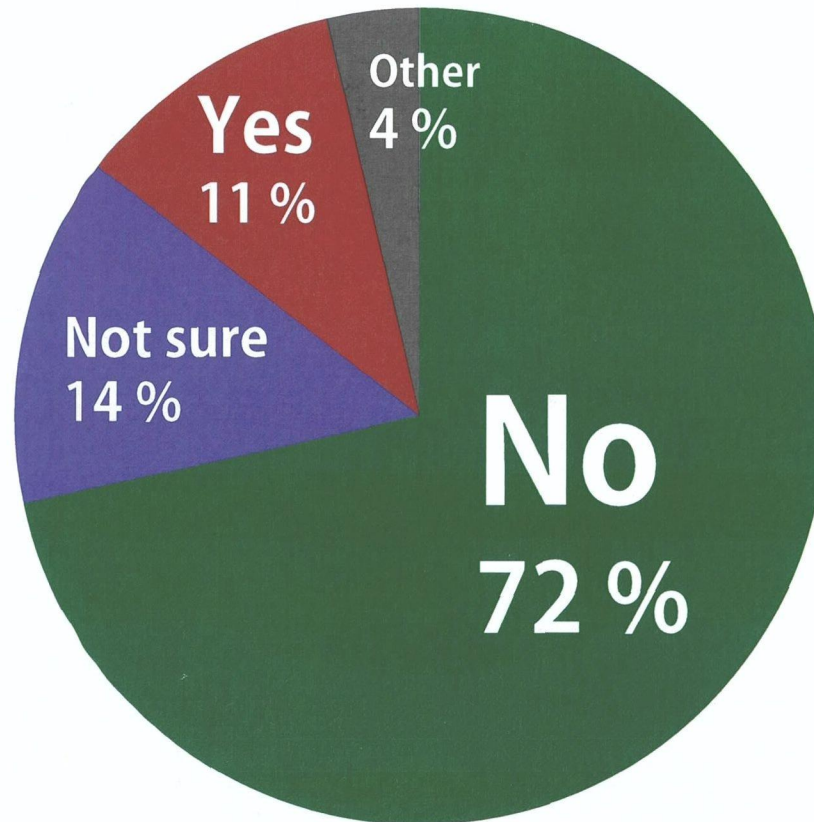
29 HHs surveyed  
140+ HHs lower Puna?

Public Transportation  
3%

25 HHs surveyed  
120+ HHs lower Puna?



# Considering leaving?



# Triggers for evacuation

When the lava approaches my property boundary  
or when ordered by authorities

2,119 households

Anytime the air quality affects my area

1,017

When the lava crosses Highway 130

506

When the lava crosses Railroad Avenue

452

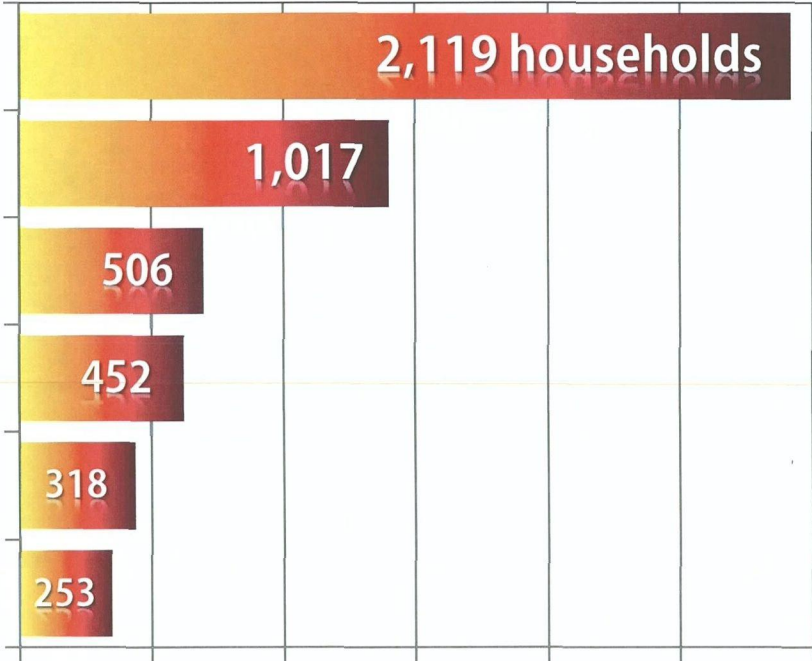
When the lava crosses Beach Road

318

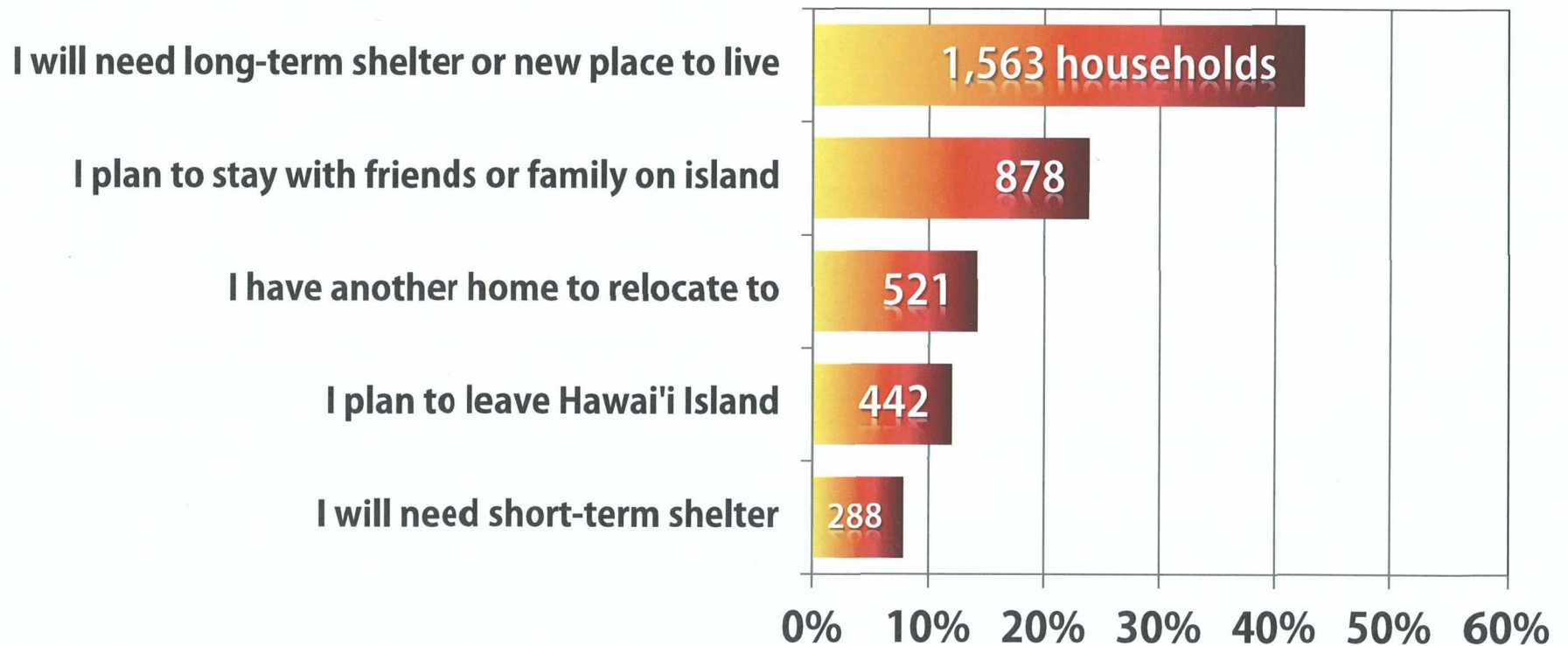
I am actively trying to leave now

253

0% 10% 20% 30% 40% 50% 60%

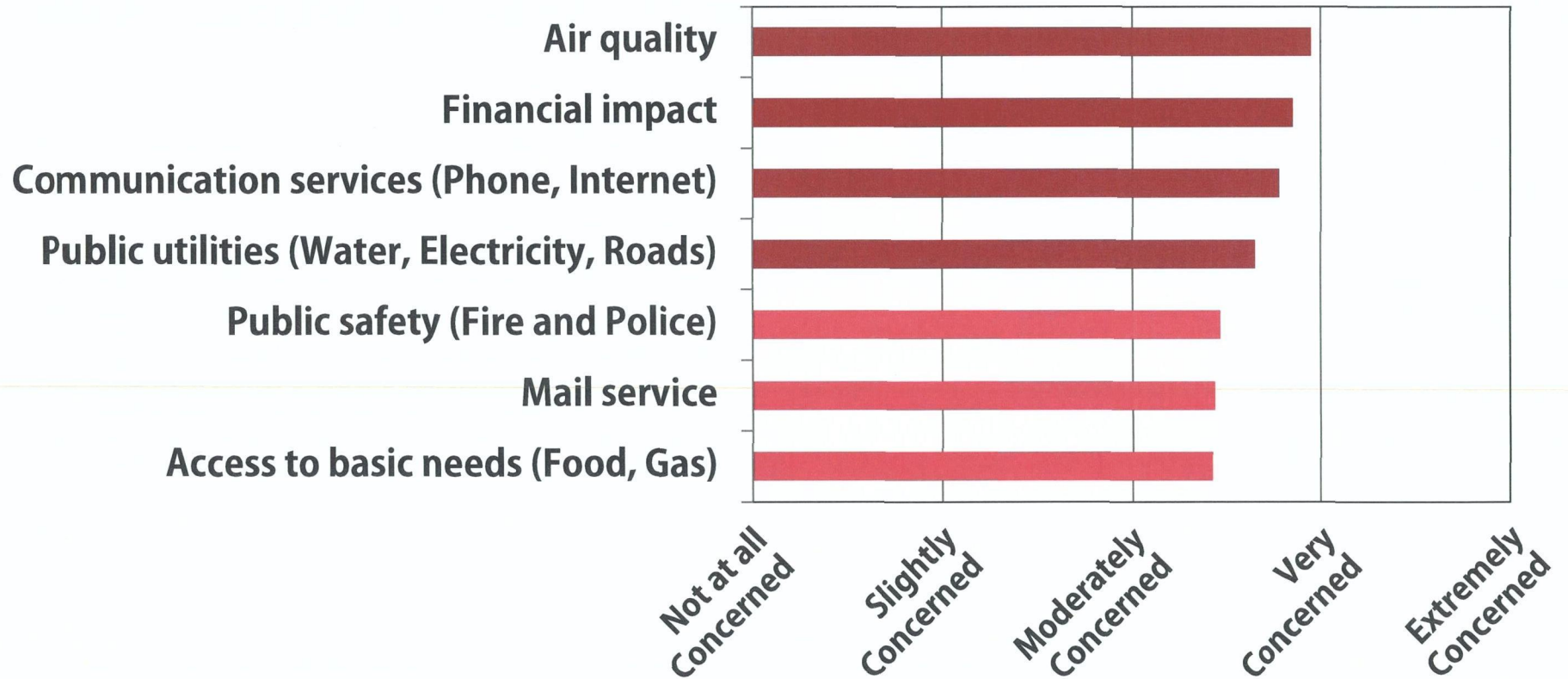


# In case of relocation:

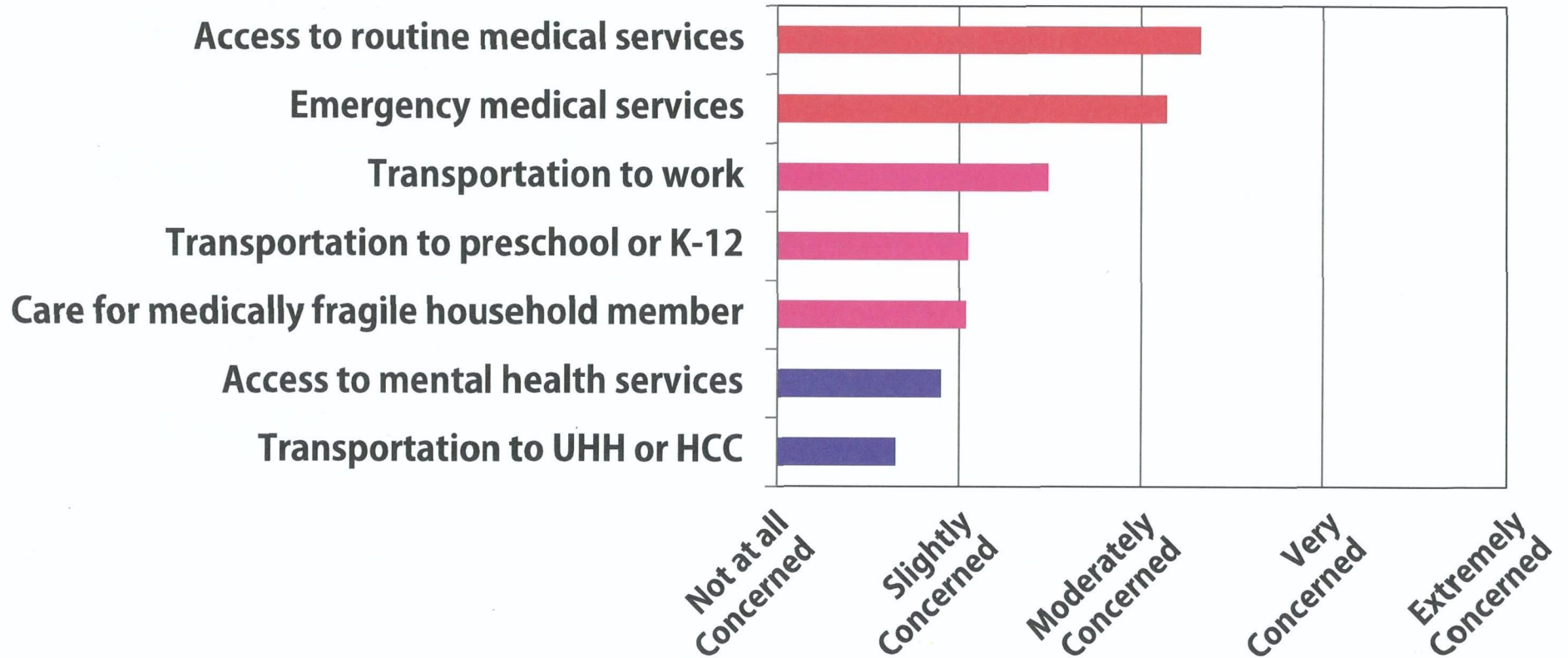




# Concerns (Top 7)



# Concerns (the rest)



# Requests for assistance

	Identified	Lower Puna (Estimate)
<b>Has someone who is:</b>		
Medically Fragile	77	382
Wheelchair bound or confined to bed	14	69
<b>Needs assistance with:</b>		
Packing/Moving	76	377
American Red Cross Resources	46	228
Health Services	41	203
Counseling	20	99

**June 27th Lava Flow  
Community Needs Survey  
(11/20/2014-12/11/2014)**





## FACT SHEET

- The American Red Cross responded to more than 74,000 disasters in communities across the United States last year and 93 percent of these were fire related.\*
- The American Red Cross is responding to 10 percent more home fires today than it was six years ago.\*
- Nationally, the number of home fires is on the rise with the number of fires increasing 8 percent since 2000. The average cost of a home fire in 2006 was more than \$17,000.\*\*\*
- Eighty percent of Americans don't realize that home fires are the single most common disaster across the nation.\*
- Only 26 percent of families have actually developed and practiced a home fire escape plan.\*
- Fires kill more Americans each year than all natural disasters combined, and affect people from all backgrounds and geographic locations.
- In 2006, a home fire was reported every 80 seconds, and someone dies from a home fire every 204 minutes.\*\*\*
- Children under five and adults over 65 are more than twice as likely to die in a home fire than the rest of the US population.\*\*
- African Americans in this country are disproportionately affected by home fires, and account for 25 percent of all fire deaths while they represent less than 13 percent of the population.\*\*
- Cooking fires are the leading cause of home fires and home fire injuries. And, two out of three cooking fires start with the range or stove.\*\*\*
- Heating fires are the second leading cause of home fires.\*\*
- Smoking is the leading cause of home fire deaths.\*\*\*
- In 2005, 74 percent of home fire deaths occurred in homes with no smoke alarms or no working smoke alarms.\*\*\*
- Sprinklers and smoke alarms together cut your risk of dying in a home fire 82% in relation to having neither.\*\*
- Each year over 200 people die from carbon monoxide produced by fuel burning appliances in the home including furnaces, ranges, water heaters and room heaters.\*\*\*
- High-rise fires are more injurious and cause more damage than all other structure fires.\*\*\*



## HOLIDAY HOME FIRES

### Fast Facts

- Nearly 47,000 fires occur during the winter holidays claiming more than 500 lives, causing more than 2,200 injuries, and costing \$554 million in property damage.\*\*
- On average, one of every 22 home fires started by Christmas trees result in death.\*\*\*
- Candle fires are four times as likely to occur during the winter holidays.\*\*
- During the winter holiday season, an average of 40 home fires per day are caused by children playing.\*\*
- The number of home fires the American Red Cross has responded to has risen 10% since 2000.\*
- Having a working smoke alarm reduces one's chances of dying in a fire by nearly half.\*\*

### Preparedness Tips

- ✓ Place Christmas trees, candles, and other holiday decorations at least three feet away from heat sources like fireplaces, portable heaters, radiators, heat vents and candles.
- ✓ Purchase flame retardant metallic or artificial trees. If you purchase a real tree, make sure that it has fresh, green needles that aren't easily broken. Keep live trees as moist as possible by giving them plenty of water.
- ✓ Make sure that light strings and other holiday decorations are in good condition. Do not use anything with frayed electrical cords and always follow the manufacturer's instructions.
- ✓ Always unplug tree and holiday lights before leaving home or going to bed.
- ✓ Never use lit candles to decorate a tree. Always extinguish candles before leaving the room or going to bed.
- ✓ Use only sturdy tree stands designed not to tip over. Keep curious pets and children away from Christmas trees.
- ✓ Keep anything that can catch on fire—pot holders, oven mitts, wooden utensils, paper or plastic bags, food packaging, and towels or curtains—away from your stove top.
- ✓ Designate one person to walk around your home to make sure that all candles and smoking materials are properly extinguished after guests leave.
- ✓ Smoke alarms save lives. Install a smoke alarm near your kitchen, on each level of your home, near sleeping areas, and inside and outside bedrooms if you sleep with doors closed. Use the test button to check it each month. Replace all batteries at least once a year.
- ✓ Visit [www.redcross.org/homefires](http://www.redcross.org/homefires) for more information on how to keep your home fire safe during the holidays.



# Aloha!

from the Hawai'i State  
Department of Health



As an international destination, we welcome visitors from all over the world.

We want everyone to enjoy a safe and healthy stay in Hawai'i.

Visitors and residents are reminded to practice healthy habits:

- Wash your hands often
- Stay home if you are feeling sick
- Cover your cough
- Avoid touching your eyes, nose or mouth



## HEALTH ADVISORY: EBOLA

If you have traveled from West Africa within the past 21 days, please call the Hawai'i Dept. of Health: **(808) 586-4586**



Watch for fever, headaches, and body aches in the next 3 weeks.

### 3 WEEKS

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4



If you get sick, call a doctor.

Tell the doctor where you traveled.



For more information, call:



# Facts *about* Ebola

You **CAN'T** get Ebola  
through **AIR**






You **CAN'T** get Ebola  
through **WATER**



You **CAN'T** get Ebola  
through **FOOD**



You can only get Ebola from

-  Touching the blood or body fluids of a person who is sick with or has died from Ebola.
-  Touching contaminated objects, like needles.
-  Touching infected fruit bats or primates (apes and monkeys).



*For more information on Ebola*

Visit the Hawai'i Department of Health website:  
**[health.hawaii.gov/docd/ebola](http://health.hawaii.gov/docd/ebola)**

Call the Aloha United Way's  
2-1-1 information line.



Clinicians reporting a possible  
Ebola case should contact the  
Hawai'i Department of Health  
Disease Outbreak Control  
at 1-808-586-4586.





# Ebola

## U.S. Hospital Readiness as of



Number of hospitals ready to treat a patient with Ebola

**35**



Number of hospitals assessed by CDC Rapid Ebola Preparedness teams

More than  
**50**  
facilities visited in  
15 states and D.C.



Percentage of travelers returning from countries affected by Ebola who reside within 200 miles of a U.S. Ebola treatment center

**83%**



Number of healthcare workers who have received Ebola training

**150,000**  
via webinars

**525,000**  
via online  
clinical resources



Number of state and local laboratories able to diagnose Ebola

**42**



# OSHA<sup>®</sup> FactSheet

## PPE Selection Matrix for Occupational Exposure to Ebola Virus

*Guidance for common exposure scenarios*

**Employers are responsible for ensuring that workers are protected from exposure to Ebola virus and that workers are not exposed to harmful levels of chemicals used for cleaning and disinfection. While most workers in the U.S. are unlikely to encounter Ebola virus or individuals with Ebola, workers whose jobs involve healthcare, mortuary/death care, airline and other transportation operations, cleaning and environmental services, law enforcement, and certain other tasks may be at higher risk for exposure.**

- Based on existing OSHA and Centers for Disease Control and Prevention (CDC) guidance, OSHA's personal protective equipment (PPE) selection matrix is intended to help employers select appropriate PPE for workers who may be exposed to Ebola virus through direct contact with blood or other potentially infectious body fluids from individuals with signs or symptoms of Ebola; objects, materials, and surfaces with Ebola-virus contamination; and exposure to bio-aerosols that may contain Ebola virus particles.
  - The matrix covers examples of common exposures, but is not intended to prescribe PPE for every worker or exposure or discuss all PPE options. In all cases, employers must identify hazards to which their workers may be exposed; provide appropriate PPE to protect them; and train them on when and how they must use it, and how to dispose of or decontaminate the equipment.
  - Employers must comply with OSHA's standards on Bloodborne Pathogens (29 CFR 1910.1030), PPE (29 CFR 1910.132), Respiratory Protection (29 CFR 1910.134), and other requirements, including those established by state plans, whenever such requirements apply.
- Visit [www.osha.gov/ebola](http://www.osha.gov/ebola) for additional information about Ebola, including information about putting on (donning) and removing (doffing) PPE. CDC guidance states that all healthcare workers involved in the care of Ebola patients must receive repeated training on and must demonstrate competency in putting on and removing proper PPE before working with Ebola patients. Workers in other sectors where exposure to the Ebola virus or someone with Ebola may be anticipated should also demonstrate competency in putting on and removing proper PPE.



Photo courtesy of CDC





## Additional resources for workers and employers

OSHA, CDC, and the National Institute for Occupational Safety and Health (NIOSH) provide guidance for workers performing a variety of tasks in healthcare and non-healthcare settings, including:

- OSHA Ebola Web page: [www.osha.gov/ebola](http://www.osha.gov/ebola)
- CDC Ebola Web page: [www.cdc.gov/ebola](http://www.cdc.gov/ebola)
- NIOSH Ebola Web page: [www.cdc.gov/niosh/topics/ebola](http://www.cdc.gov/niosh/topics/ebola)

**Note:** This document is not intended to cover all OSHA standards that may apply. State plans adopt and enforce their own occupational safety and health standards at [www.osha.gov/dccsp/osp](http://www.osha.gov/dccsp/osp).

<sup>1</sup> Most workers in office environments normally do not require PPE to perform their job tasks safely. In settings where there is no reason to anticipate exposure to Ebola virus, no new or additional PPE is warranted.

<sup>2</sup> Risk factors for Ebola include contact with blood or other body fluids or human remains of a patient known to have or suspected of having Ebola; residence in or travel to an area where Ebola transmission is active; and direct handling of bats or non-human primates from disease-endemic areas: [www.cdc.gov/vhf/ebola/exposure/risk-factors-when-evaluating-person-for-exposure.html](http://www.cdc.gov/vhf/ebola/exposure/risk-factors-when-evaluating-person-for-exposure.html).

<sup>3</sup> Signs and symptoms of Ebola include fever, severe headache, muscle pain, weakness, diarrhea, vomiting, abdominal (stomach) pain, and unexplained hemorrhage (bleeding or bruising): [www.cdc.gov/vhf/ebola/symptoms](http://www.cdc.gov/vhf/ebola/symptoms).

<sup>4</sup> Handling of samples from individuals with suspected or confirmed Ebola, or research samples of Ebola virus, should be done in containment (e.g., in a biosafety cabinet, BSC) to protect workers and to prevent contamination of surfaces outside the BSC. OSHA recommends that clinical laboratory testing work described in this matrix be conducted at, a minimum, Biosafety Level (BSL) 2 with BSL 3 precautions, using at least a Class II BSC; and that research work be conducted at BSL 4 using a Class III BSC. Following a risk assessment and development of a comprehensive strategy for mitigating lab worker exposures, some types of specimens from individuals with suspected or confirmed Ebola may be safely handled and tested in the core clinical laboratory (i.e., at levels lower than BSL-2 with 3 precautions) using an integrated approach. Such an approach may involve decontaminating and packaging samples in containment within an Ebola patient care area; use of specialized equipment that does not require opening/uncapping tubes, centrifugation, or other aerosol-generating procedures; training on and use of appropriate PPE; and proper waste handling and disposal techniques.

<sup>5</sup> Package waste according to OSHA's Bloodborne Pathogens standard (29 CFR 1910.1030) and, if transporting waste off-site for treatment and disposal, DOT's Hazardous Materials Regulations (49 CFR 172).

<sup>6</sup> Consider the amount of vomit and watery excrement a patient is producing when selecting these items. Material thickness, fluid resistance, seam integrity, and the amount of time a worker can comfortably wear a protective garment should be considered when selecting gowns, coveralls and aprons. When the anticipated risk of exposure to blood and body fluids is low, employers should provide workers with fluid-resistant garments. Fluid-resistant gowns should meet American National Standards Institute (ANSI) / Association for the Advancement of Medical Instrumentation (AAMI) PB70 Level 3 requirements. Fluid-resistant coveralls should be made of fabric and constructed with seams that pass: (1) American Association of Textile Chemists and Colorists (AATCC) 42 Impact Penetration Test at 1 g or below and AATCC 127 Hydrostatic Head Test at 50 cm or above, or (2) EN 20811 Hydrostatic Head Test at 50 cm or above, or (3) American Society for Testing and Materials (ASTM) F1670 Synthetic Blood Penetration Resistance Test, or (4) International Organization for Standardization (ISO) 16603 Synthetic Blood Penetration Resistance Test (at 3.5 kilopascal [kPa] or above). When the anticipated risk of exposure to blood and body fluids is high, employers should provide workers with impermeable garments. Impermeable isolation or surgical gowns should meet the ANSI/AAMI PB70 Level 4 requirements. Impermeable coveralls should be made of fabric and constructed with seams that pass ASTM F1671 Bloodborne Pathogen Penetration Resistance Test or ISO 16604 Bloodborne Pathogen Penetration Resistance Test (at 14 kPa or higher). In absence of manufacturer-provided data on seams, select a garment constructed with an appropriate seaming technique (e.g., taped seams).

<sup>7</sup> In instances where workers may be exposed to bio-aerosols (e.g., as a result of spraying liquids or air during cleaning) suspected of or known to contain Ebola virus, medically qualified workers must use, at a minimum, a NIOSH-approved, fit-tested N95 respirator. A full-face elastomeric respirator or PAPR offers a higher level of protection (i.e., greater assigned protection factor, APF) than a half-mask elastomeric respirator or disposable N95. When using elastomeric respirators or PAPRs while using disinfectants that may pose a chemical hazard, a combination particulate/chemical cartridge may be necessary to protect workers from exposure to the chemicals in addition to Ebola virus particles. Note that disposable N95 respirators and certain cartridges for elastomeric respirators may be adversely affected by an increase in moisture and spray from certain work tasks, including during cleaning and decontamination. In such instances, or during other tasks to improve worker comfort, a supplied-air respirator (SAR) may be an alternative.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: 1-877-889-5627.

For assistance, contact us. We can help. It's confidential.



[www.osha.gov](http://www.osha.gov) (800) 321-OSHA (6742)



U.S. Department of Labor



# OSHA<sup>®</sup> FactSheet

## Cleaning and Decontamination of Ebola on Surfaces

### *Guidance for Workers and Employers in Non-Healthcare/Non-Laboratory Settings*

Workers tasked with cleaning surfaces that may be contaminated with Ebola virus, the virus that causes Ebola Virus Disease (EVD, or Ebola), must be protected from exposure. Employers are responsible for ensuring that workers are protected from exposure to Ebola virus and harmful levels of chemicals used for cleaning and disinfection.

#### **Guidelines for cleaning and disinfection**

- Workers must wear appropriate personal protective equipment (PPE) when conducting cleaning and decontamination activities.
- Immediately clean and disinfect any surfaces contaminated with blood, urine, feces, vomit, or other body fluids that are suspected or known to contain Ebola virus.
- Isolate areas of suspected Ebola virus contamination until decontamination is completed to minimize exposure of individuals not performing the work.
- Use signage to restrict access to areas of suspected or known Ebola virus contamination until decontamination is completed to minimize exposure of individuals not performing the work.
- Treat any visible contamination with a suitable disinfectant (described at right).
- If there is a bulk spill or bulk matter (e.g., vomit or diarrhea), cover the material fully with absorbent material (e.g., paper towels), then pour disinfectant on to saturate the area.
- Allow disinfectant to soak into spills for the recommended time period for the specific disinfectant being used (see manufacturer's instructions).
- To assure complete disinfection, further disinfect the surface after the bulk material(s) has been removed, using a suitable disinfectant.

#### **Disinfectants for Ebola virus**

- Use an EPA-registered disinfectant suitable for non-enveloped viruses (e.g., norovirus, rotavirus, adenovirus, poliovirus) to treat contamination/spills and to disinfect surfaces after bulk spill material has been removed.
- Non-enveloped viruses are typically more difficult to destroy than enveloped viruses, such as Ebola. Stronger disinfectants used to destroy non-enveloped viruses are considered effective against more susceptible enveloped viruses.
- See EPA List L of selected registered antimicrobial products that meet the Centers for Disease Control and Prevention's (CDC) criteria for use against Ebola virus: [www.epa.gov/oppad001/list-l-ebola-virus.html](http://www.epa.gov/oppad001/list-l-ebola-virus.html).
- Always follow the manufacturer's instructions (e.g., concentration, application method and contact time) for the specific disinfectant being used.
- When EPA-registered disinfectants are unavailable, a 10% solution of common household bleach in water (e.g., 1 cup of bleach in 9 cups of water) may be an effective alternative.
- **Never mix chemicals together.** Certain combinations of chemicals can be deadly or can reduce the effectiveness of the disinfectant.

- Ensure adequate ventilation in areas where workers are using disinfectants, including by opening windows and doors, or using mechanical ventilation equipment.
- In some cases, the use of chemical disinfectants may require an employer to train workers on how to protect themselves against chemical hazards and comply with OSHA's Hazard Communication, 29 CFR 1910.1200, and other standards.
- Use tools, such as tongs from a spill kit, as much as possible rather than doing cleanup work directly with gloved hands.
- After cleaning and disinfection work is complete, remove PPE in a way that avoids self-contamination, as described below.
- Avoid cleaning techniques, such as using pressurized air or water sprays, that may result in the generation of bioaerosols.

#### **Guidelines for waste disposal**

- Follow disinfectant label instructions for treating waste materials, including used PPE, with a disinfectant. Double-bag materials and place it in a leakproof container to further reduce the risk of worker exposure. Use a puncture-proof container for sharps.
- It may be necessary to dispose of contaminated objects with porous surfaces that cannot be disinfected.
- Dispose of waste from surface cleanup in accord with OSHA's Bloodborne Pathogens standard, 29 CFR 1910.1030; CDC guidelines, [www.cdc.gov/vhf/ebola/hcp](http://www.cdc.gov/vhf/ebola/hcp); and the U.S. Department of Transportation's (DOT) Hazardous Materials Regulations (HMR), [phmsa.dot.gov/hazmat/transporting-infectious-substances](http://phmsa.dot.gov/hazmat/transporting-infectious-substances).

#### ***Use appropriate protective equipment***

Employers must select personal protective equipment (PPE) that will protect workers against Ebola virus and other hazards to which they may be exposed. Workers must wear PPE to help minimize exposure to the virus via mucous membranes or non-intact skin, or through inhalation of bioaerosols (aerosolized droplets containing infectious particles that can be inhaled). Examples of PPE that may be needed during cleaning and decontamination include:

- Nitrile gloves (consider double gloving, including heavy-duty rubber gloves over nitrile);
- Goggles or face shields;
- Fluid-resistant or fluid-impermeable gowns, coveralls, and aprons;
- Facemasks (e.g., surgical masks) that cover the nose and mouth; and
- Dedicated work clothing and washable shoes with shoe/boot covers.

In some cases, additional respiratory protection (e.g., N95 or powered air-purifying respirators, or better) may be necessary to protect workers from exposure to Ebola and/or disinfectants. Depending on the hazards posed by the size of a spill, degree of contamination, or other factors, required PPE may be different than what is described in this Fact Sheet.

Training, practice, and observation of workers in correct donning and doffing of PPE are important infection control measures. Workers should put on PPE in a way that minimizes the risk of skin and mucous membrane contact with potentially infectious materials; and remove PPE in a way that avoids self-contamination. This may include removing outer gloves simultaneously with gown or coveralls, decontaminating PPE between removal steps, or other measures. The order of PPE removal may vary depending on the type of PPE a worker uses, the nature of the work tasks being performed, and which devices or garments are contaminated, among other factors.

For updated information, see [www.osha.gov/ebola](http://www.osha.gov/ebola) or CDC's Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus: [www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html](http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html). The National Institute for Occupational Safety and Health (NIOSH) also provides recommendations for the selection and use of protective clothing and respirators for protection against biological agents: [www.cdc.gov/niosh/docs/2009-132](http://www.cdc.gov/niosh/docs/2009-132).

### **Use appropriate respiratory protection**

- In instances where workers may be exposed to bioaerosols (e.g., as a result of spraying liquids or air during cleaning) suspected of or known to contain Ebola virus, additional respiratory protection is needed. In these cases, medically qualified workers must use, at a minimum, a NIOSH-approved, fit-tested N95 respirator.
- Wearing a respirator for extended periods of time can be uncomfortable. Workers who need to use respirators for long durations may find powered air-purifying respirators more tolerable.
- Respirators used for protecting workers against Ebola virus may not be effective for also protecting them from exposure to certain toxic chemicals used for cleaning and decontamination. To learn more about the requirements for selecting an appropriate respirator to protect against chemical exposure (elastomeric respirator with appropriate chemical cartridges or a supplied-air respirator), consult OSHA's Respiratory Protection standard, 29 CFR 1910.134, and the manufacturer's Safety Data Sheet (SDS) for the specific chemical(s) that workers are using. See OSHA's Respiratory Protection web page: [www.osha.gov/SLTC/respiratoryprotection](http://www.osha.gov/SLTC/respiratoryprotection).

### **Follow applicable OSHA standards**

- Employers must ensure that they comply with OSHA's Bloodborne Pathogens standard, 29 CFR 1910.1030, to protect workers who may be exposed to blood or other potentially infectious materials.
- OSHA's Personal Protective Equipment (PPE) standard, 29 CFR 1910.132, provides additional information about selection and use of appropriate PPE, training and other requirements. Respirators are covered by OSHA's Respiratory Protection standard, 29 CFR 1910.134.
- Employers must comply with OSHA's Hazard Communication standard, 29 CFR 1910.1200, when their workers use certain chemicals for cleaning and decontamination.

- In some cases where a specific OSHA standard doesn't apply, the General Duty Clause (Sec. 5(a)(1)) of the *Occupational Safety and Health Act* requires employers to furnish to each employee employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to employees.

### **Additional OSHA resources**

- Safety and Health Topics web page for Ebola [www.osha.gov/SLTC/ebola](http://www.osha.gov/SLTC/ebola)
- Safety and Health Topics page for Bloodborne Pathogens (and Needlesticks) [www.osha.gov/SLTC/bloodbornepathogens](http://www.osha.gov/SLTC/bloodbornepathogens)
- Safety and Health Topics web page for PPE [www.osha.gov/SLTC/personalprotectiveequipment](http://www.osha.gov/SLTC/personalprotectiveequipment)
- Safety and Health Topics web page for Respiratory Protection [www.osha.gov/SLTC/respiratoryprotection](http://www.osha.gov/SLTC/respiratoryprotection)
- Safety and Health Topics web page for Hazardous and Toxic Substances [www.osha.gov/SLTC/hazardoustoxicsubstances](http://www.osha.gov/SLTC/hazardoustoxicsubstances)
- Hazard Communication web page [www.osha.gov/dsg/hazcom](http://www.osha.gov/dsg/hazcom)

### **Assistance for Employers**

OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. On-site Consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing safety and health management systems. To locate the OSHA On-site Consultation Program nearest you, call 1-800-321-6742 (OSHA) or visit [www.osha.gov/consultation](http://www.osha.gov/consultation).

**Note:** This document is not intended to cover all OSHA standards that may apply. State Plans adopt and enforce their own occupational safety and health standards at [www.osha.gov/dcsp/csp](http://www.osha.gov/dcsp/csp). Additionally, this guidance is not for cleanup and decontamination of Ebola virus released as a biological weapon. See OSHA's emergency preparedness and response resources for information related to biological terrorism: [www.osha.gov/SLTC/emergencypreparedness](http://www.osha.gov/SLTC/emergencypreparedness).